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May 20, 2010

***Via Email & First Class Mail***

Matthew C. Ireland, Esq.
Assistant Attorney General
Environmental Protection Division
Attorney General's Office
100 Cambridge Street, 10th Floor
Boston, MA 02114

John A. Carrigan, Section Chief
Solid Waste Management
DEP-Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

**Re: Commonwealth of Massachusetts v. New Ventures Associates, LLC; Suffolk Superior Court, C.A. No. SUCV2006-00790; Response to Request for Closure and Post-Closure Estimates; Request for Release of Monies**

Dear Attorney Ireland and Mr. Carrigan:

This office represents New Ventures Associates, LLC ("New Ventures") with respect to the above-referenced action. In accordance with Judge Cratsley's Order, enclosed please find the detailed explanation for the remaining closure and post-closure costs associated with the Crow Lane Landfill. The attachments are separated into two categories, closure costs and post-closure costs. You will note that the total closure costs are $1,538,307 while the post-closure costs are $603,200 for a total of $2,141,507. The monies for the closure are based upon the current berm design with the rock buttresses referenced by the Department. The costs are based upon conservative estimates for berm construction, equipment and media.

New Ventures continues to be disappointed that the Department will not discuss the sequence of closure and berm approval and will not communicate except through letters and press releases. The Department's failure to discuss the closure of the Landfill and its decision to deny the berm design has delayed closure as New Ventures has stated for many months. The Department's recommended design of attaching a skirt to the berm prevents loaming and seeding of the Landfill. In addition to the closure figures, New Ventures has enclosed recent readings to document the significant drop in $H_2S$ production due to closure. Finally, New Ventures has completed the repair of the limited FML damaged by the wind and is not aware of any odor complaints. The strength analysis performed on the FML and the Project Engineer's findings are attached.

Under the provisions of 310 CMR 19.051(8) New Ventures hereby requests the release of $570,000 from the Financial Assurance Mechanism based upon the fact that New Ventures is in final closure and the remaining monies equal or exceed the necessary cost of closure and post-closure.

Please contact this office immediately with the authorization to release the monies from the FAM account.

Thank you.

Sincerely,

Richard A. Nylen, Jr.

RAN/kad
Enclosures

cc: Mr. William Thibeault/NVLLC
Mr. Richard Chalpin
Michael W. Dingle, Esq.
Mr. Michael Quatromoni

H:\Thibeault, William\SUCV2006-0790\Letter to Ireland & Carrigan 05-20-10.doc

# COST ESTIMATE
# REMAINING CLOSURE OF CROW LANE LANDFILL
# MAY 2010

| | | | | |
|---|---|---|---|---|
| 1 | **COMPLETE BASIN 2 BLASTING AND EXCAVATION** | | | |
| | Balance remaining on D&R contract to completE basin 2 | | $30,000 | |
| | | ***Sub-total*** | | ***$30,000*** |
| 2 | **CONSTRUCT BERMs** | | | |
| | Materials : | | | |
| | South berm fill 1,575 cy @ $10/cy | | $15,750 | |
| | West berm slope flattening 4,835 cy @ $15/cy | | $72,525 | |
| | Rock butress boulders 2,226 cy @ $18.75 cy | | $41,738 | |
| | Rip rap slope stabilizer 6,821 cy @ $18.75 | | $127,894 | |
| | Fill for MSE 7,800 cy @ $15/cy | | $117,000 | |
| | | | **$374,907** | |
| | **Equipment (2 month duration)** | | | |
| | Dozer @ $10,000/mo | | $20,000 | |
| | Roller @ $8,000/mo | | $16,000 | |
| | 2-Excavators @ $10,000/mo each | | $40,000 | |
| | 2- rock trucks @ $8,000/mo each | | $32,000 | |
| | | | **$108,000** | |
| | **Equipment (MSE Berm-2 month)** | | | |
| | Dozer @ $10,000/mo | | $20,000 | |
| | Roller @ $8,000/mo | | $16,000 | |
| | Rock truck @ $8,000/mo | | $16,000 | |
| | Loader @ $8,000/mo | | $16,000 | |
| | 2-Excavators @$10,000/mo each | | $40,000 | |
| | | | **$108,000** | |
| | **Labor (Berm Construction 2 months)** | | | |
| | 1-Foreman, 2-Laborers @ $20/hour (avg) | | | |

**COST ESTIMATE**
**REMAINING CLOSURE OF CROW LANE LANDFILL**
**MAY 2010**

| | | |
|---|---|---|
| 3x8 weeks x 5days/per week x 8 hours/per day @ $20 | $19,200 | |
| 4-Equip. Operators x 8 weeks x 5 days per week x 8 hours @25 | $32,000 | |
| | **$51,200** | |
| **Labor (MSE construction-2 month)** | | |
| 1-Foreman, 5-Laborers @ $20/hour (avg.) | | |
| 6x8 weeks x 5days/per week x 8 hours/per day @ $20 | $38,400 | |
| 4-Equip. Operators x 8 weeks x 5 days per week x 8 hours @25 | $32,000 | |
| | **$70,400** | |
| ***SUBTOTAL*** | | ***$712,507*** |

**3 PLACE DRAINAGE AND VEGETATIVE LAYERS (2 month duration)**

| | | |
|---|---|---|
| Materials | | |
| Sand 22,600cy @ $15 | $339,000 | |
| Loam 15,000cy @ $15 | $75,000 | |
| | **$414,000** | |
| **Equipment (2 MONTHS)** | | |
| Dozer @ $10,000/mo | $20,000 | |
| 2-RockTrucks @ $8,000/mo | $32,000 | |
| Loader @ $8,000/mo | $16,000 | |
| | **$68,000** | |
| **Labor (3 Months)** | | |
| Grading Forman 1 x 12 weeks x 40 hours/per week @ $30.00 | $14,400 | |
| Laborers 4 x 12 weeks x 40 hours/per week @ $20 | $38,400 | |
| 4-Equip. Operators x 8 weeks x 5 days per week x 8 hours @25 | $32,000 | |
| | **$84,800** | |

Seed, mulch and maintain to 1st growth

**COST ESTIMATE**
**REMAINING CLOSURE OF CROW LANE LANDFILL**
**MAY 2010**

| | | | |
|---|---|---|---|
| 14.2 acres @ $ 5,000 per acre | | $71,000 | |
| | ***SUBTOTAL*** | | ***$637,800*** |
| **4 STORMWATER DRAINAGE, LANDFILL SURFACE** | | | |
| Materials | | | |
| 4" to 8" crushed rock, 1,100cy @ $20cy | | $22,000 | |
| **Equipment (2-Month)** | | | |
| 1-Gradall @ $10,000/mo | | $20,000 | |
| 1-Rock truck @ $8,000/mo | | $16,000 | |
| 1-Dozer @ $10,000/mo | | $20,000 | |
| 1-Loader @ $8,000/mo | | $16,000 | |
| | | **$72,000** | |
| **Labor (2-month)** | | | |
| 1 Foreman, 4 Laborers @ $20/hr (avg.) | | | |
| 5 x 8 weeks x 40 hours/per week @ $20 | | $32,000 | |
| 4-Equip. Operators x 8 weeks x 5 days per week x 8 hours @25 | | $32,000 | |
| | | **$64,000** | |
| | ***SUBTOTAL*** | | ***$158,000*** |
| **TOTAL REMAINING CLOSURE COST AS OF 05-14-10** | | | **$1,538,307** |

COST ESTIMATE
POST CLOSURE
CROW LANE LANDFILL*
MAY 14, 2010

**UPDATED CLOSURE/POST CLOSURE COST ESTIMATE**
**BASIS OF ESTIMATE AND ASSUMPTIONS PURSUANT TO COURT ORDER**
**MARCH 30, 2010, PARAGRAPH 4**

a) The length of time the LFG control system is proposed to operate:

5 YEARS, THIS IS BASED ON THE EXPERIENCE OF New Ventures consultants with similar closures and with the present conditions. Specifically once the landfill is capped, i.e. the flexible membrane is in place, the source of water is removed. The landfill capping was completed in the fall of 2009 except for a small portion. Remaining moisture will be used up in degradation process, then gas production will cease. Experience at other landfills indicates that this occurs one to two months to 1 year post capping. 5 year period carried greatly exceeds empirical experience. Attached are the most recent gas production numbers that show the dramatic drop in gas production following capping at the landfill with the noteworthy reductions in the wells associated with the 2006/2007 first phase closure.

b) The amount of pretreatment media that will be utilized including the purchase and disposal costs:

The current use of media is 100cy/year. Estimate 2 years @ 100cy/year, 3 years @ 50cy/year (see time frame in a) above) for a 350cy total. The media that is currently on hand at the Wood Waste yard in Everett, exceeds this amount and is set aside for post-closure. Further, New Ventures believes that the 95% destruction rate in the Appendix should be replaced with a ceiling (such as 700 ppm) eventually as the $H_2S$ levels reduce over time.

c) The amount and cost for the collection and disposal of condensate:

Condensate is produced more heavily in the winter with lesser amounts during other 3 seasons. Condensate is stored in a 10,000 gallon tanker on site, emptied once a year with significant room to spare. Post-closure costs assume a conservative 10,000 gallon per year @ 0.20 per gallon for 5 years. $10,000 total.

d) The cost of the maintenance and replacement of the pretreatment tanks:

COST ESTIMATE
POST CLOSURE
CROW LANE LANDFILL*
MAY 14, 2010

One trained operator @ 8 hours/week x 52 weeks x 5 years @ $20.00/hour = $41,600. Experience at the site is that the three (3) containers last about 3 years before corrosion causes erosion and vacuum leaks. Allow for two rounds of container replacement during the 5 years of operation. 6 new containers @ $5,000 per container = $30,000. $71,600 total.

e) The cost of the maintenance and replacement of the enclosed flare:

Allow maintenance/part replacement @ $10,000 per year x 5 years = $50,000. Working life of the flare far exceeds the 5 years it will be needed, flare replacement $120,000. While other equipment will need to be replaced, the flare is in good working condition.

f) The labor cost to operate, maintain and monitor the operation of the LFG control system:

Mainentance will include a daily visit to determine that the pretreatment system is operating. 8 hours/week x 52 weeks = 416 hours @ $20/hour = $8,320/year; Misc. parts replacement $5,000 per year; $13,320 x 5 years = $66,600 total.

g) The quantity and cost of propane as an auxiliary for the enclosed flare:

Current cost of propane as the auxillary fuel is $4,000 per year. We anticipate reduced usage as $H_2S$ levels drop. Conservative estimate $5,000 @ 5years = $25,000 total.

h) The inspection and maintenance of the landfill cover including mowing, storm water controls, erosion

Control and general maintenance involves a person on-site once per month. The conservative estimate 1 day/month x 8 hrs/day x 12 mo/yr $20/per hour = $1,920/yr. Materials and equipment allowance $2,000/yr. Mowing to be outsourced (even swap for hay). Use 5,000/yr total.

i) The collection and disposal of leachate including the volume and disposal cost:

Only 1 leachate collection tank (#5) remains on-site. New Ventures anticipates leachate flow to be nonexistent after 1 year from the date of final membrane cover based upon experience. Leachate is

j) The itemized cost of conducting environmental monitoring of the landfill including labor for sample collection and report preparation and the sample analytical costs:

$14,200/event
Annual sampling 1st 5 years - $71,000
2 year frequency next 10 years - $71,000
5 year frequency final 15 years - $28,400
Total - $170,400

COST ESTIMATE
POST CLOSURE
CROW LANE LANDFILL*
MAY 14, 2010

| | | |
|---|---|---|
| 1 | **OPERATE LFG SYSTEM ( 5yrs)** | |
| | b) Replacement Media - On Hand | $0 |
| | c) Condensate - collect and dispose $2,000/year x 5 years | $10,000 |
| | d) Maintain/replace pretreat tanks | $71,600 |
| | e) Enclosed flare Maintenance $10,000/yr x 5 | $50,000 |
| | Repair allowance for flare | $50,000 |
| | f) Operate, maintain, monitor LFGcollection system $13,320/yr x 5 yrs | $66,600 |
| | g) Propane alternate fuel | $25,000 |
| 2 | **INSPECT/MAINTAIN LANDFILL COVER/DRAINAGE SYSTEMS** | |
| | h) $5,000/year allowance x 30 yrs | $150,000 |
| 3 | **COLLECTION/DISPOSAL OF LEACHATE** | |
| | i) included in item 1c above | |
| 4 | **AS-BUILT DRAWINGS** | $10,000 |
| 5 | **ENVIRONMENTAL MONITORING** | $170,000 |
| | J) Estimate per Sitec | |
| | **TOTAL POST CLOSURE COST** | **$603,200** |

*Note: See basis of post-closure estimate attached after this page.

# Crow Lane Landfill
## Collection System Monitoring Report

Sam

Date: 5/7/2010 Barometric Pressure: 30.01 Performed by dana g

Weather: clear Temp: 48

| Location | Gas Readings | | | | | | | Wellhead Data | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CH_4$ | $CO_2$ | $O_2$ | Balance Gas | $H_2S$ | Temp | CO (Temp > 130° F) | Header Pressure | Well Pressure | Valve Position | Flow |
| | (%) | (%) | (%) | (%) | (ppm) | (°F) | (ppm) | (inches) | (inches) | (% Open) | (cfm) |
| FLARE | 19.1 | 25 | 5.6 | 50.2 | trace | 1650 | | 18 | -- | 0.5 | 300 |
| EW1 | 33.1 | 29.8 | 0.1 | 34.3 | 5,000 | 85 | | 0.2 | 0.5 | 0.5 | |
| EW2 | 33.3 | 29.8 | 2.6 | 34.3 | 1,500 | 85 | | 0.6 | 0.6 | 0.5 | |
| EW3 | 41.7 | 31.6 | 4.2 | 25.1 | 500 | 85 | | 1.5 | 0.8 | 0.5 | |
| EW4 | 38 | 34.5 | 0.1 | 27.3 | 2,000 | 85 | | 0.6 | 0.9 | 0.5 | |
| EW5 | 50.9 | 37.3 | 0.1 | 11.2 | 1,500 | 85 | | 0.4 | 0.4 | 0.5 | |
| EW6 | 40.8 | 36.8 | 0.2 | 22 | 2,000 | 85 | | 0.5 | 0.5 | 0.5 | |
| EW7 | 26.6 | 33.0 | 0.1 | 40.5 | 23,500 | 85 | | 0.1 | 0.1 | 0.5 | |
| EW8 | 4.6 | 16.6 | 3 | 75.7 | 2,400 | 85 | | 0.1 | 0.1 | 0.5 | |
| EW9 | 58.1 | 41.2 | 0.0 | 0.1 | 1,200 | 85 | | 0.1 | 0.1 | 0.5 | |
| EW10 | 44.1 | 43.8 | 0.1 | 12.1 | 6,000 | 85 | | 0.4 | 0.3 | 0.5 | |
| EW11 | 34.6 | 33.3 | 2.2 | 29.9 | 6,000 | 85 | | 0.1 | 0.3 | 0.5 | |
| EW12 | 34.6 | 38.4 | 0.1 | 26.5 | 4,000 | 85 | | 0.5 | 0.5 | 0.5 | |
| EW13 | 50.1 | 44.0 | 0.1 | 5.6 | 27,000 | 85 | | 0.7 | 0.7 | 0.5 | |
| EW14 | 19.5 | 34.5 | 0.3 | 46.3 | 22,000 | 85 | | 0.3 | 0.3 | 0.5 | |

# Crow Lane Landfill
## Collection System Monitoring Report

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EW15 | | | | | | | | | | | |
| EW16 | 42.7 | 41.7 | 0.4 | 14.5 | 24,000 | 85 | | 0.1 | 0.1 | 0.5 | |

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

## constant rate of extension (CRE) tensile testing machine

| Specimen Number | Machine Direction | | Cross Machine Direction | |
|---|---|---|---|---|
| | Thickness, mil | Tear Resistance, lb | Thickness, mil | Tear Resistance, lb |
| 1 | 39.8 | 43 | 44.9 | 37 |
| 2 | 43.6 | 39 | 43.6 | 38 |
| 3 | 44.6 | 38 | 47.3 | 39 |
| 4 | 41.6 | 40 | 45.4 | 36 |
| 5 | 48.2 | 43 | 50.6 | 38 |
| 6 | 40.6 | 38 | 41.4 | 39 |
| 7 | 40.7 | 39 | 47.7 | 36 |
| 8 | 46.9 | 45 | 47.2 | 38 |
| 9 | 47.8 | 38 | 44.8 | 37 |
| 10 | 39.6 | 39 | 48.3 | 35 |
| Average | 43.3 | 40 | 46.1 | 37 |
| Standard Deviation | 3.36 | 2.5 | 2.61 | 1.4 |

**Comments:**

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #2 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

## constant rate of extension (CRE) tensile testing machine

| Specimen Number | Machine Direction | | Cross Machine Direction | |
|---|---|---|---|---|
| | Thickness, mil | Tear Resistance, lb | Thickness, mil | Tear Resistance, lb |
| 1 | 45.1 | 38 | 41.3 | 35 |
| 2 | 45.9 | 40 | 46.7 | 38 |
| 3 | 45.7 | 42 | 49.4 | 36 |
| 4 | 49.0 | 41 | 49.5 | 37 |
| 5 | 42.3 | 44 | 45.1 | 36 |
| 6 | 47.0 | 38 | 42.3 | 37 |
| 7 | 43.9 | 42 | 42.3 | 36 |
| 8 | 43.9 | 43 | 46.7 | 39 |
| 9 | 43.0 | 39 | 44.3 | 38 |
| 10 | 46.0 | 38 | 43.1 | 36 |
| Average | 45.2 | 41 | 45.0 | 37 |
| Standard Deviation | 2.00 | 2.2 | 2.92 | 1.2 |

**Comments:**

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE New #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

## constant rate of extension (CRE) tensile testing machine

| Specimen Number | Machine Direction | | Cross Machine Direction | |
|---|---|---|---|---|
| | Thickness, mil | Tear Resistance, lb | Thickness, mil | Tear Resistance, lb |
| 1 | 49.0 | 43 | 48.8 | 39 |
| 2 | 52.2 | 46 | 49.4 | 37 |
| 3 | 49.3 | 42 | 43.8 | 39 |
| 4 | 47.0 | 42 | 49.1 | 38 |
| 5 | 53.7 | 44 | 47.3 | 38 |
| 6 | 50.1 | 44 | 49.1 | 40 |
| 7 | 43.0 | 42 | 46.7 | 38 |
| 8 | 46.9 | 41 | 42.6 | 39 |
| 9 | 43.9 | 41 | 49.7 | 39 |
| 10 | 46.5 | 40 | 43.4 | 36 |
| Average | 48.1 | 43 | 47.0 | 38 |
| Standard Deviation | 3.39 | 1.9 | 2.75 | 1.1 |

**Comments:**

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

| | | | |
|---|---|---|---|
| Testing Machine: | Instron 1123 | Testing Speed: | 2.0 in./min. |
| Grip Separation: | 2.5 in. | Grips: | ATS pneumatic |
| Temperature,°F: | 66.2 - 73.4 | Die Type: | IV |

| Direction | Specimen Number | Thickness, mil | YIELD | | | BREAK | | |
|---|---|---|---|---|---|---|---|---|
| | | | Tensile Strength, | | Elongation, | Tensile Strength, | | Elongation, |
| | | | ppi | psi | % | ppi | psi | % |
| Machine | 1 | 45.9 | 128 | 2789 | 14 | 151 | 3303 | 565 |
| | 2 | 43.7 | 118 | 2708 | 10 | 128 | 2937 | 469 |
| | 3 | 46.2 | 121 | 2628 | 13 | 142 | 3069 | 552 |
| | 4 | 44.7 | 128 | 2870 | 17 | 140 | 3133 | 553 |
| | 5 | 44.2 | 125 | 2828 | 14 | 149 | 3370 | 612 |
| | Average | 44.9 | 124 | 2765 | 14 | 142 | 3162 | 550 |
| | Standard Deviation | 1.1 | 4.2 | 97 | 2.5 | 9.1 | 175 | 51.6 |
| Cross Machine | 1 | 43.1 | 130 | 3016 | 13 | 107 | 2478 | 276 |
| | 2 | 51.7 | 129 | 2501 | 12 | 99 | 1922 | 217 |
| | 3 | 48.0 | 123 | 2560 | 10 | 104 | 2163 | 248 |
| | 4 | 48.7 | 134 | 2749 | 13 | 109 | 2235 | 229 |
| | 5 | 40.2 | 129 | 3220 | 13 | 115 | 2858 | 239 |
| | Average | 46.3 | 129 | 2809 | 12 | 107 | 2331 | 242 |
| | Standard Deviation | 4.6 | 3.9 | 305 | 1.3 | 5.8 | 355 | 22.3 |

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #2 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

| | | | |
|---|---|---|---|
| Testing Machine: | Instron 1123 | Testing Speed: | 2.0 in./min. |
| Grip Separation: | 2.5 in. | Grips: | ATS pneumatic |
| Temperature,°F: | 66.2 - 73.4 | Die Type: | IV |

| Direction | Specimen Number | Thickness, mil | YIELD | | | BREAK | | |
|---|---|---|---|---|---|---|---|---|
| | | | Tensile Strength, | | Elongation, | Tensile Strength, | | Elongation, |
| | | | ppi | psi | % | ppi | psi | % |
| Machine | 1 | 46.7 | 121 | 2585 | 15 | 124 | 2657 | 473 |
| | 2 | 45.9 | 125 | 2729 | 13 | 145 | 3166 | 546 |
| | 3 | 42.8 | 125 | 2932 | 14 | 122 | 2845 | 467 |
| | 4 | 43.3 | 123 | 2845 | 14 | 142 | 3290 | 567 |
| | 5 | 41.8 | 125 | 2990 | 15 | 142 | 3391 | 551 |
| | Average | 44.1 | 124 | 2816 | 14 | 135 | 3070 | 521 |
| | Standard Deviation | 2.1 | 2.0 | 163 | 0.8 | 11.2 | 309 | 47.1 |
| Cross Machine | 1 | 42.9 | 141 | 3289 | 14 | 114 | 2660 | 203 |
| | 2 | 41.2 | 132 | 3210 | 10 | 121 | 2944 | 549 |
| | 3 | 43.3 | 135 | 3110 | 12 | 127 | 2927 | 488 |
| | 4 | 44.4 | 135 | 3053 | 14 | 97 | 2189 | 233 |
| | 5 | 44.6 | 130 | 2924 | 13 | 110 | 2472 | 330 |
| | Average | 43.3 | 135 | 3117 | 13 | 114 | 2638 | 361 |
| | Standard Deviation | 1.3 | 4.1 | 141 | 1.7 | 11.3 | 319 | 153 |

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE New #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

| | | | |
|---|---|---|---|
| Testing Machine: | Instron 1123 | Testing Speed: | 2.0 in./min. |
| Grip Separation: | 2.5 in. | Grips: | ATS pneumatic |
| Temperature,°F: | 66.2 - 73.4 | Die Type: | IV |

| Direction | Specimen Number | Thickness, mil | YIELD | | | BREAK | | |
|---|---|---|---|---|---|---|---|---|
| | | | Tensile Strength, | | Elongation, | Tensile Strength, | | Elongation, |
| | | | ppi | psi | % | ppi | psi | % |
| Machine | 1 | 43.1 | 120 | 2786 | 13 | 135 | 3137 | 515 |
| | 2 | 42.4 | 128 | 3011 | 15 | 140 | 3300 | 510 |
| | 3 | 42.9 | 122 | 2840 | 13 | 173 | 4037 | 662 |
| | 4 | 43.1 | 121 | 2817 | 15 | 146 | 3383 | 557 |
| | 5 | 43.5 | 126 | 2892 | 14 | 156 | 3586 | 567 |
| | Average | 43.0 | 123 | 2869 | 14 | 150 | 3489 | 562 |
| | Standard Deviation | 0.4 | 3.2 | 88 | 1.0 | 15.0 | 347 | 61.2 |
| Cross Machine | 1 | 41.1 | 134 | 3260 | 12 | 123 | 3008 | 488 |
| | 2 | 43.1 | 135 | 3129 | 12 | 120 | 2780 | 483 |
| | 3 | 45.3 | 137 | 3035 | 10 | 111 | 2453 | 390 |
| | 4 | 43.3 | 135 | 3108 | 13 | 130 | 3009 | 499 |
| | 5 | 44.3 | 128 | 2893 | 10 | 131 | 2957 | 513 |
| | Average | 43.4 | 134 | 3085 | 11 | 123 | 2841 | 475 |
| | Standard Deviation | 1.6 | 3.4 | 135 | 1.3 | 8.2 | 237 | 48.7 |

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked B' | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

## constant rate of extension (CRE) tensile testing machine

| Specimen Number | Machine Direction | | Cross Machine Direction | |
|---|---|---|---|---|
| | Thickness, mil | Tear Resistance, lb | Thickness, mil | Tear Resistance, lb |
| 1 | 39.8 | 43 | 44.9 | 37 |
| 2 | 43.6 | 39 | 43.6 | 38 |
| 3 | 44.6 | 38 | 47.3 | 39 |
| 4 | 41.6 | 40 | 45.4 | 36 |
| 5 | 48.2 | 43 | 50.6 | 38 |
| 6 | 40.6 | 38 | 41.4 | 39 |
| 7 | 40.7 | 39 | 47.7 | 36 |
| 8 | 46.9 | 45 | 47.2 | 38 |
| 9 | 47.8 | 38 | 44.8 | 37 |
| 10 | 39.6 | 39 | 48.3 | 35 |
| Average | 43.3 | 40 | 46.1 | 37 |
| Standard Deviation | 3.36 | 2.5 | 2.61 | 1.4 |

**Comments:**

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked B' | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #2 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

## constant rate of extension (CRE) tensile testing machine

| Specimen Number | Machine Direction | | Cross Machine Direction | |
|---|---|---|---|---|
| | Thickness, mil | Tear Resistance, lb | Thickness, mil | Tear Resistance, lb |
| 1 | 45.1 | 38 | 41.3 | 35 |
| 2 | 45.9 | 40 | 46.7 | 38 |
| 3 | 45.7 | 42 | 49.4 | 36 |
| 4 | 49.0 | 41 | 49.5 | 37 |
| 5 | 42.3 | 44 | 45.1 | 36 |
| 6 | 47.0 | 38 | 42.3 | 37 |
| 7 | 43.9 | 42 | 42.3 | 36 |
| 8 | 43.9 | 43 | 46.7 | 39 |
| 9 | 43.0 | 39 | 44.3 | 38 |
| 10 | 46.0 | 38 | 43.1 | 36 |
| Average | 45.2 | 41 | 45.0 | 37 |
| Standard Deviation | 2.00 | 2.2 | 2.92 | 1.2 |

**Comments:**

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked B' | rmt |
| Sample ID: | GMBR: 40 THDPE New #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

## constant rate of extension (CRE) tensile testing machine

| Specimen Number | Machine Direction | | Cross Machine Direction | |
|---|---|---|---|---|
| | Thickness, mil | Tear Resistance, lb | Thickness, mil | Tear Resistance, lb |
| 1 | 49.0 | 43 | 48.8 | 39 |
| 2 | 52.2 | 46 | 49.4 | 37 |
| 3 | 49.3 | 42 | 43.8 | 39 |
| 4 | 47.0 | 42 | 49.1 | 38 |
| 5 | 53.7 | 44 | 47.3 | 38 |
| 6 | 50.1 | 44 | 49.1 | 40 |
| 7 | 43.0 | 42 | 46.7 | 38 |
| 8 | 46.9 | 41 | 42.6 | 39 |
| 9 | 43.9 | 41 | 49.7 | 39 |
| 10 | 46.5 | 40 | 43.4 | 36 |
| Average | 48.1 | 43 | 47.0 | 38 |
| Standard Deviation | 3.39 | 1.9 | 2.75 | 1.1 |

**Comments:**

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

| | | | |
|---|---|---|---|
| Testing Machine: | Instron 1123 | Testing Speed: | 2.0 in./min. |
| Grip Separation: | 2.5 in. | Grips: | ATS pneumatic |
| Temperature,°F: | 66.2 - 73.4 | Die Type: | IV |

| Direction | Specimen Number | Thickness, mil | YIELD | | | BREAK | | |
|---|---|---|---|---|---|---|---|---|
| | | | Tensile Strength, | | Elongation, | Tensile Strength, | | Elongation, |
| | | | ppi | psi | % | ppi | psi | % |
| Machine | 1 | 45.9 | 128 | 2789 | 14 | 151 | 3303 | 565 |
| | 2 | 43.7 | 118 | 2708 | 10 | 128 | 2937 | 469 |
| | 3 | 46.2 | 121 | 2628 | 13 | 142 | 3069 | 552 |
| | 4 | 44.7 | 128 | 2870 | 17 | 140 | 3133 | 553 |
| | 5 | 44.2 | 125 | 2828 | 14 | 149 | 3370 | 612 |
| | Average | 44.9 | 124 | 2765 | 14 | 142 | 3162 | 550 |
| | Standard Deviation | 1.1 | 4.2 | 97 | 2.5 | 9.1 | 175 | 51.6 |
| Cross Machine | 1 | 43.1 | 130 | 3016 | 13 | 107 | 2478 | 276 |
| | 2 | 51.7 | 129 | 2501 | 12 | 99 | 1922 | 217 |
| | 3 | 48.0 | 123 | 2560 | 10 | 104 | 2163 | 248 |
| | 4 | 48.7 | 134 | 2749 | 13 | 109 | 2235 | 229 |
| | 5 | 40.2 | 129 | 3220 | 13 | 115 | 2858 | 239 |
| | Average | 46.3 | 129 | 2809 | 12 | 107 | 2331 | 242 |
| | Standard Deviation | 4.6 | 3.9 | 305 | 1.3 | 5.8 | 355 | 22.3 |

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE Existing #2 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

| | | | |
|---|---|---|---|
| Testing Machine: | Instron 1123 | Testing Speed: | 2.0 in./min. |
| Grip Separation: | 2.5 in. | Grips: | ATS pneumatic |
| Temperature,°F: | 66.2 - 73.4 | Die Type: | IV |

| Direction | Specimen Number | Thickness, mil | YIELD | | | BREAK | | |
|---|---|---|---|---|---|---|---|---|
| | | | Tensile Strength, | | Elongation, | Tensile Strength, | | Elongation, |
| | | | ppi | psi | % | ppi | psi | % |
| Machine | 1 | 46.7 | 121 | 2585 | 15 | 124 | 2657 | 473 |
| | 2 | 45.9 | 125 | 2729 | 13 | 145 | 3166 | 546 |
| | 3 | 42.8 | 125 | 2932 | 14 | 122 | 2845 | 467 |
| | 4 | 43.3 | 123 | 2845 | 14 | 142 | 3290 | 567 |
| | 5 | 41.8 | 125 | 2990 | 15 | 142 | 3391 | 551 |
| | Average | 44.1 | 124 | 2816 | 14 | 135 | 3070 | 521 |
| | Standard Deviation | 2.1 | 2.0 | 163 | 0.8 | 11.2 | 309 | 47.1 |
| Cross Machine | 1 | 42.9 | 141 | 3289 | 14 | 114 | 2660 | 203 |
| | 2 | 41.2 | 132 | 3210 | 10 | 121 | 2944 | 549 |
| | 3 | 43.3 | 135 | 3110 | 12 | 127 | 2927 | 488 |
| | 4 | 44.4 | 135 | 3053 | 14 | 97 | 2189 | 233 |
| | 5 | 44.6 | 130 | 2924 | 13 | 110 | 2472 | 330 |
| | Average | 43.3 | 135 | 3117 | 13 | 114 | 2638 | 361 |
| | Standard Deviation | 1.3 | 4.1 | 141 | 1.7 | 11.3 | 319 | 153 |

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

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| | | | |
|---|---|---|---|
| Client: | New Ventures Associates | | |
| Project Name: | Crow Lane Landfill | | |
| Project Location: | Newburyport, MA | | |
| GTX #: | 9825 | Tested By: | bfs |
| Test Date: | 04/29/10 | Checked By: | rmt |
| Sample ID: | GMBR: 40 THDPE New #1 | | |
| Description: | Black, 40 mil textured THDPE | | |

# Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D 6693

| | | | |
|---|---|---|---|
| Testing Machine: | Instron 1123 | Testing Speed: | 2.0 in./min. |
| Grip Separation: | 2.5 in. | Grips: | ATS pneumatic |
| Temperature, °F: | 66.2 - 73.4 | Die Type: | IV |

| Direction | Specimen Number | Thickness, mil | YIELD | | | BREAK | | |
|---|---|---|---|---|---|---|---|---|
| | | | Tensile Strength, | | Elongation, | Tensile Strength, | | Elongation, |
| | | | ppi | psi | % | ppi | psi | % |
| Machine | 1 | 43.1 | 120 | 2786 | 13 | 135 | 3137 | 515 |
| | 2 | 42.4 | 128 | 3011 | 15 | 140 | 3300 | 510 |
| | 3 | 42.9 | 122 | 2840 | 13 | 173 | 4037 | 662 |
| | 4 | 43.1 | 121 | 2817 | 15 | 146 | 3383 | 557 |
| | 5 | 43.5 | 126 | 2892 | 14 | 156 | 3586 | 567 |
| | Average | 43.0 | 123 | 2869 | 14 | 150 | 3489 | 562 |
| | Standard Deviation | 0.4 | 3.2 | 88 | 1.0 | 15.0 | 347 | 61.2 |
| Cross Machine | 1 | 41.1 | 134 | 3260 | 12 | 123 | 3008 | 488 |
| | 2 | 43.1 | 135 | 3129 | 12 | 120 | 2780 | 483 |
| | 3 | 45.3 | 137 | 3035 | 10 | 111 | 2453 | 390 |
| | 4 | 43.3 | 135 | 3108 | 13 | 130 | 3009 | 499 |
| | 5 | 44.3 | 128 | 2893 | 10 | 131 | 2957 | 513 |
| | Average | 43.4 | 134 | 3085 | 11 | 123 | 2841 | 475 |
| | Standard Deviation | 1.6 | 3.4 | 135 | 1.3 | 8.2 | 237 | 48.7 |

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.